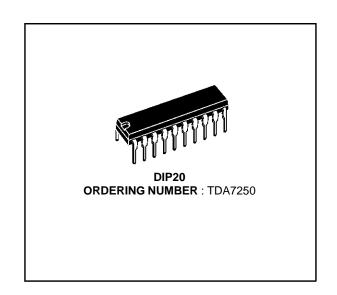


# 60 W HI-FI DUAL AUDIO DRIVER

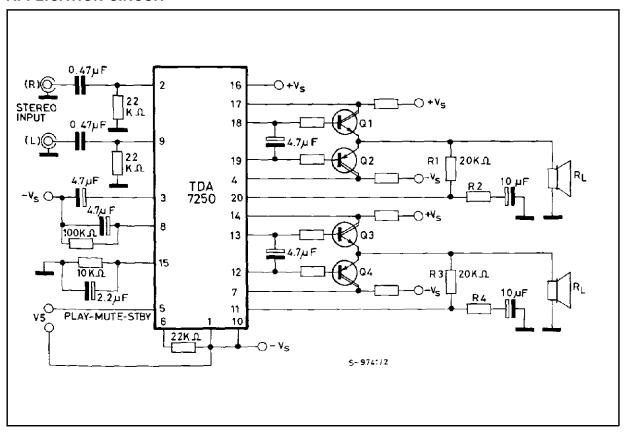
- WIDE SUPPLY VOLTAGE RANGE: 20 TO 90 V (± 10 to ± 45 V)
- VERY LOW DISTORTION
- AUTOMATIC QUIESCENT CURRENT CONTROL FOR THE POWER TRANSISTORS WITHOUT TEMPERATURE SENSE ELEMENTS
- OVERLOAD CURRENT PROTECTION FOR THE POWER TRANSISTORS
- MUTE/STAND-BY FUNCTIONS
- LOW POWER CONSUMPTION
- $\blacksquare$  OUTPUT POWER 60 W/8  $\Omega$  AND 100 W/4  $\Omega$

#### **DESCRIPTION**

The TDA7250 stereo audio driver is designed to drive two pair of complementary output transistor in the Hi-Fi power amplifiers.

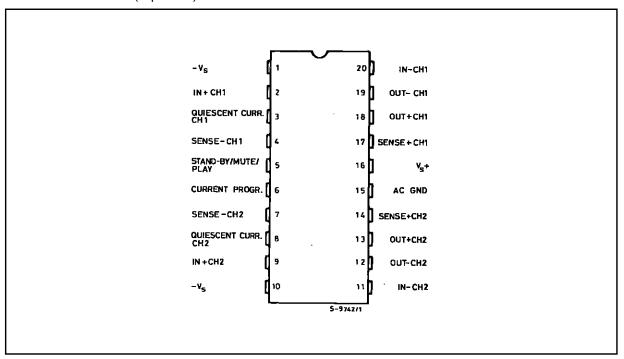


#### **APPLICATION CIRCUIT**



March 1995 1/11

### PIN CONNECTION (top view)



#### **ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
Vs	Supply Voltage	100	<b>V</b>
P <sub>tot</sub>	Power Dissipation at T <sub>amb</sub> = 60 °C	1.4	W
T <sub>i</sub> , T <sub>stq</sub>	Storage and Junction Temperature	- 40 to + 150	°C

### THERMAL DATA

Symbol	nbol Parameter		Value	Unit
R <sub>th i-amb</sub>	Thermal Resistance Junction-ambient	Max.	65	°C/W

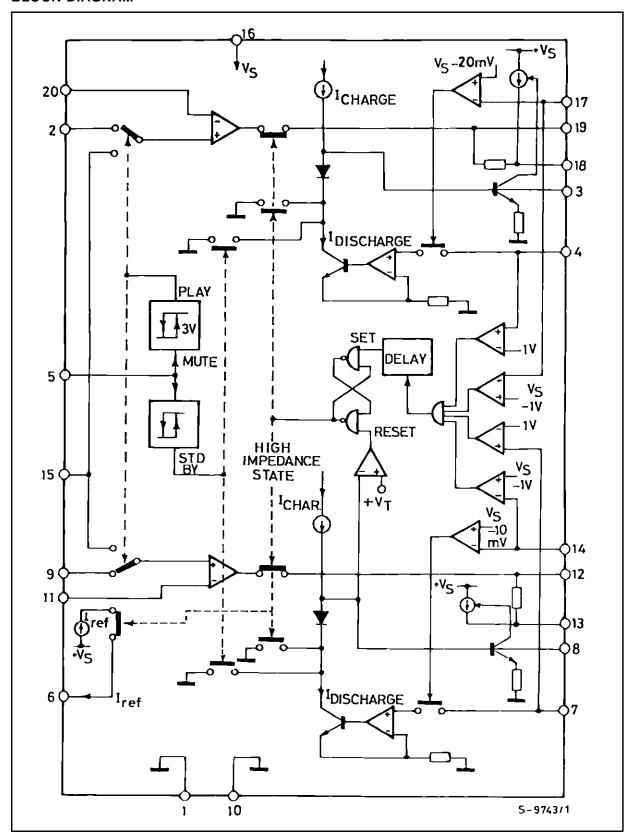


#### **PIN FUNCTIONS**

N°	Name	Function			
1	V <sub>S</sub> – POWER SUPPLY	Negative Supply Voltage.			
2	NON-INV. INP. CH. 1	Channel 1 Input Signal.			
3	QUIESC. CURRENT CONTR. CAP. CH1	This capacitor works as an integrator, to control the quiescent current to output devices in no-signal conditions on channel 1.			
4	SENSE (-) CH. 1	Negative voltage sense input for overload protection and for automatic quiescent current control.			
5	ST. BY / MUTE / PLAY	Three-functions Terminal. For $V_{IN}=1$ to 3 V, the device is in MUTE and only quiescent current flows in the power stages ; - for $V_{IN}<1$ V, the device is in STAND-BY mode and no quiescent current is present in the power stages ; - for $V_{IN}>3$ V, the devic			
6	CURRENT PROGRAM	High Impedance Power-stages Monitor.			
7	SENSE (-) CH. 2	Negative Voltage Sense Input for Overload Protection and for Automatic Quiescent Current Control.			
8	QUIESC. CURRENT CONTR. CAP. CH. 2	This capacitor works as an integrator, to control the quiescent current to output devices in no-signal conditions on channel 2. If the voltage at its terminals drops under 250 mV, it also resets the device from high-impedance state of output stages.			
9	NON-INV. INP. CH. 2	Channel 2 Input Signals.			
10	V <sub>s</sub> – POWER SUPPLY	Negative Supply Voltage.			
11	INVERT. INP. CH. 2	Feedback from Output (channel 2).			
12	OUT (-) CH. 2	Out Signal to Lower Driver Transistor of Channel 2.			
13	OUT (+) CH. 2	Out Signal to Higher Driver Transistor of Channel 2.			
14	SENSE (+) CH. 2	Positive Voltage Sense Input for Overload Protection and for Automatic Quiescent Current Control.			
15	COMMON AC GROUND	AC Input Ground in MUTE Condition.			
16	Vs + POWER SUPPLY	Positive Supply Voltage.			
17	SENSE (+) CH. 1	Positive Voltage Sense Input for Overload Protection and for Automatic Quiescent Current Control.			
18	OUT (+) CH. 1	Out Signal to High Driver Transistor of Channel 1.			
19	OUT (-) CH. 1	Out Signal to Low Driver Transistor of Channel 1.			
20	INVERT. INP. CH. 1	Feedback from Output (channel 1).			



#### **BLOCK DIAGRAM**



## **ELECTRICAL CHARACTERISTICS** ( $T_{amb}$ = 25 $^{\circ}C$ , $V_{s}$ = $\pm$ 35 V, play mode, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
Vs	Supply Voltage		± 10		± 45	V
l <sub>d</sub>	Quiescent Drain Current	Stand-by Mode		8		mA
		Play Mode		10	14	
I <sub>b</sub>	Input Bias Current			0.2	1	μΑ
Vos	Input Offset Voltage			1	± 10	mV
Ios	Input Offset Current			100	200	nA
G√	Open Loop Voltage Gain	f = 100 Hz		90		dB
		f = 10 kHz		60		
e <sub>N</sub>	Input Noise Voltage	$R_G = 600 \Omega$ B = 20 Hz to 20 kHz		3		μV
SR	Slew Rate			10		V/μs
d	Total Harmonic Distortion	$G_v = 26 \text{ dB}, P_o = 40 \text{ W}$ f = 1  kHz f = 20  kHz		0.004 0.03		% %
$V_{opp}$	Output Voltage Swing			60		$V_{pp}$
Po	Output Power (*)	$V_{S} = \pm 35 \text{ V}, R_{L} = 8 \Omega$ $V_{S} = \pm 30 \text{ V}, R_{L} = 8 \Omega$ $V_{S} = \pm 35 \text{ V}, R_{L} = 4 \Omega$		60 40 100		W W W
Ιο	Output Current			± 5		mA
SVR	Supply Voltage Rejection	f = 100 Hz		75		dB
Cs	Channel Separation	f = 1 kHz		75		dB

#### **MUTE / STANDBY/ PLAY FUNCTIONS**

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
li	Input Current (pin 5)			0.1		μΑ
$V_{th}$	Comparator Standby / Mute Threshold (**)		1.0	1.25	1.5	<b>V</b>
Н	Hysteresis Standby / Mute			200		mV
$V_{th}$	Comparator Mute / Play Threshold (**)		2.4	3.0	3.6	>
Н	Hysteresis Mute / Play			300		mV
	Mute Attenuation	f = 1 kHz		60		dB
Vi	Input Voltage Max. (pin 5)		12 (**)			V

#### **CURRENT SURVEY CIRCUITRY**

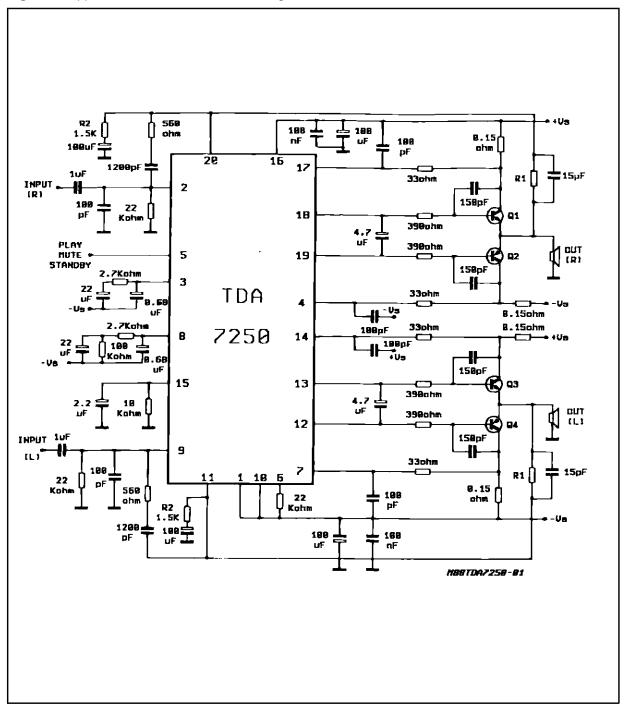
Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
	Comparator Reference	to + V <sub>S</sub>	0.8	1	1.4	V
		to - V <sub>S</sub>	0.8	1	1.4	V
t <sub>d</sub>	Delay Time		10			μs

### QUIESCENT CURRENT CONTROL

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
	Capacitor Current	Charge	30	60		μΑ
		Discharge	250	500		μΑ
	Comparator Reference	to + V <sub>S</sub>	10	20	25	mV
		to - Vs		10		mV



Figure 1: Application Circuit with Power Darlingtons.



**Note :** Q1/Q2 = Q3/Q4 = TIP 142/TIP147

 $\mathsf{GV} = 1 + \mathsf{R1/R2}$ 

Figure 2: Output Power vs. Supply Voltage.

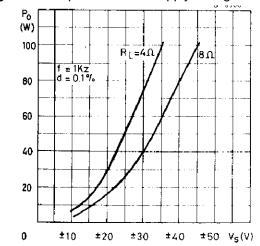


Figure 4: Channel Separation.

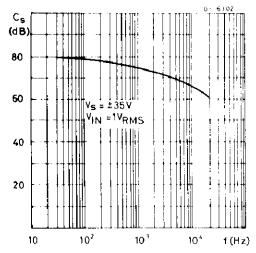


Figure 6: Quiescent Current vs. Supply Voltage.

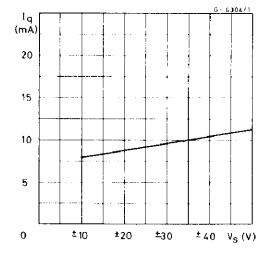
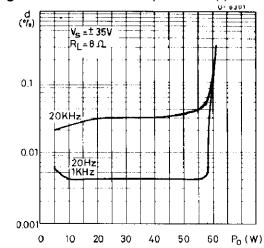


Figure 3: Distortion vs.Output Power (\*).



**Figure 5 :** Supply Voltage Rejection vs. Frequency.

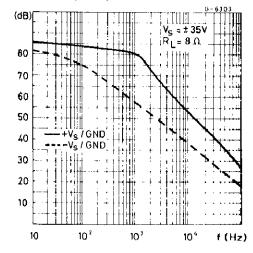
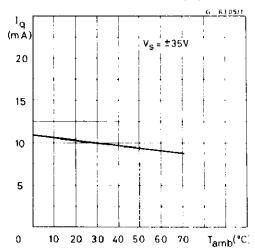


Figure 7: Quiescent Current vs. Tamb.



**Figure 8 :** Total Dissipated Power vs. Output Power (\*).

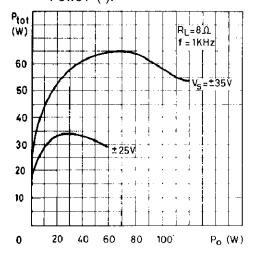
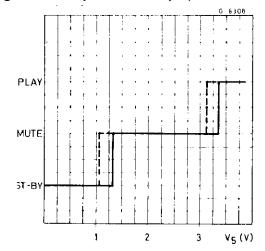
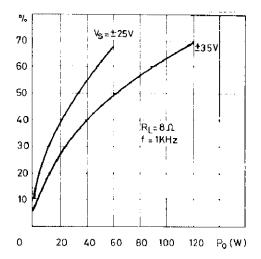


Figure 10: Play-mute Standby Operation.



(\*) Complete circuit

Figure 9: Efficiency vs. Output Power (\*).



568 oha R2 188 UF 100 1.5K B.15 nF 100pF 180uF 330hm 20 16 17 150pf | 180 R1 INPUT ( (C) BD 2 100 22 18 **(6)** 01 Kohm 398ohm PLAY 390ohm I CHI MUTE 4 5 13 STANDBY **(**C) 80 2.7Kphm 3 150pF | 100 TDA 0.68 4 8.15chm 33ohm 7250 2.7Kohm 33ohm 8.15phm 199pF 14 199pF 100 🚣 158pF 0188 BD 912 15 13 Q1 3980hm TUO 390ohm (L) 12 92 INPUT 1UF 158pF | 198 9 (L) 7 15pF 330hm R1 0.15 568 22 Kohm 189 ohm μF 1.5K 1288 108 106 υF M88TDA7258-82

Figure 11: Application Circuit Using Power Transistors.

Figure 12: Suggested Transistor Types for Various Loads and Powers.

 $R_L = 8 \Omega$ 

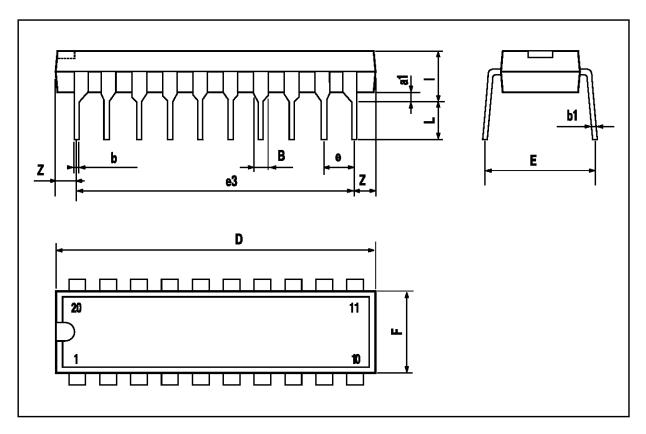
15W	+30W	+50W	+70W
BDX	BDX	BDW	TIP
53/54A	53/54B	93/94B	142/147

30W	+50W	+90W	+130W
BDW	BDW	BDV	MJ
93/94A	93/94B	64/65B	11013/11014

 $T_L = 4 \Omega$ 

# **DIP20 PACKAGE MECHANICAL DATA**

DIM.		mm			inch	
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
В	0.85		1.40	0.033		0.055
b		0.50			0.020	
b1	0.38		0.50	0.015		0.020
D			24.80			0.976
E		8.80			0.346	
е		2.54			0.100	
e3		22.86			0.900	
F			7.10			0.280
I			5.10			0.201
L		3.30			0.130	
Z			1.27			0.050



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